

## ***Does Agriculture Compute?***

Computers are a fact of modern life. Most of us deal with them directly or indirectly every day—from using an automated teller machine at the bank, to getting a computer-generated reminder to make an appointment with the dental hygienist.

Agricultural researchers, like all scientists, have been using computers for years. They use them to process data, as well as to control complex laboratory equipment and to run complicated models.

Computers are also making a big impact on farming and ranching. Computers make precise control of machinery practical; they make record keeping easier; and they make it possible for the farmer and rancher to run “what if” scenarios so that different management decisions can be tried and their many possible outcomes observed.

But farmers and ranchers, like all people, need to keep in mind that a computer is simply a tool—in many ways just a fancier shovel—not an all-powerful force.

That is one of the dangers of computers: It is easy to fall into the trap of automatically accepting as the best decision the option offered by the computer. As with human communications, if you ask a computer the wrong question, you are likely to get the wrong answer.

Computers can only incorporate facts and relationships that they are told to include and consider. A computer is not capable of original thought—at least not yet.

As programs, equipment, and data get more complex as well as piled higher and higher, it may become tempting to relinquish decision-making to the machine—letting

decisions be made by default, without really understanding the choices and how the computer arrived at them.

Ideally, decisionmaking should remain in the farmer's and rancher's hands. In the end, the human needs to examine possibilities and tell the computer what choice to execute. The computer just allows a person to explore more options in a reasonable length of time and to keep better track of information.

Like all new technology, computers also give rise to new ethical and legal issues.

For example, precision farming has led to the creation of many new businesses providing services to analyze soil characteristics. When individual farmers contract with a company for specific services, who actually owns the data? An analogy would be a patient who pays to find out if an arm or leg is broken. The patient pays for the information, but who owns the x-ray? Can a doctor use that x-ray for other purposes, such as writing a book, without the patient's permission?

Can agricultural information be incorporated into larger databases without the farmer's permission?

This question of who owns what information may become more important as large data banks are built up for various regions. For example, could—or should—a local, state, or federal government be able to buy copies of data from computer service firms in order to develop detailed pictures of environmental conditions across a region? What about basing environmental regulations on this information?

As with computers in general, agricultural computer hardware and software are evolving very fast. New companies are starting up almost every day, more complex software is becoming available, and hardware

with more capabilities is coming on the market. Today, there are farms with home pages and agricultural Internet forums like Successful Farming@AgOnline, where agricultural computing issues are major topics of electronic conversation.

Although computer-controlled equipment is becoming commonplace on farms and more farmers are keeping their records on a PC instead of in the pocket of their overalls, we are not likely to see completely remote farming any time soon. No one is going to be able to sit in an office in Manhattan, New York, and control combines harvesting wheat in Manhattan, Kansas.

No matter how sophisticated the computers become, farmers will still have to tend their soil and the crops.

Computers are just providing a way for each farmer to gather and juggle a lot more of the information needed to arrive at management decisions.

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